NEW RIVER ECOSYSTEM RESTORATION

CAP - SECTION 1135

US ARMY CORPS OF ENGINEERS

NEW ORLEANS DISTRICT

Economics and Environmental

Agenda

1. Introduction
2. Corps Process Overview
3. History of New River
4. Initial Investigations and Data Collection - Brief
5. Alternative Analysis
6. Recommendation
7. Questions

Introduction

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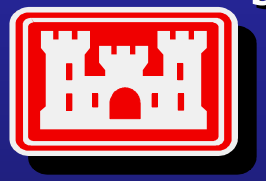


Corps of Engineers – Process

1. Problem Perception by local community
2. Request for Federal Assistance
3. Study Problem and Report Preparation
4. Report and Project Cooperation Agreement (PCA) Review
5. Execute PCA
6. Construction

Local Sponsor Responsibility

- Letter – of – Intent to start Preliminary Restoration Plan
- 25% of Feasibility, PED, and Construction costs
  - Can perform 80% of the 25% as work-in-kind
- Provide all Lands, Easements, Rights of Way, Relocations, and Disposal (LERRD) Areas
  - LERRDs credited toward 25% cost share
- 100% of Operation, Maintenance, Rehabilitation, Restoration, and Repair

History of New River

History of New River

- Was once a tributary of the Mississippi River
- Cut off from Mississippi River by levees
- Lower Portion dredged and straightened to facilitate drainage
- Weir installed in Gonzales, La to dilute septic tank effluent

Initial Investigations

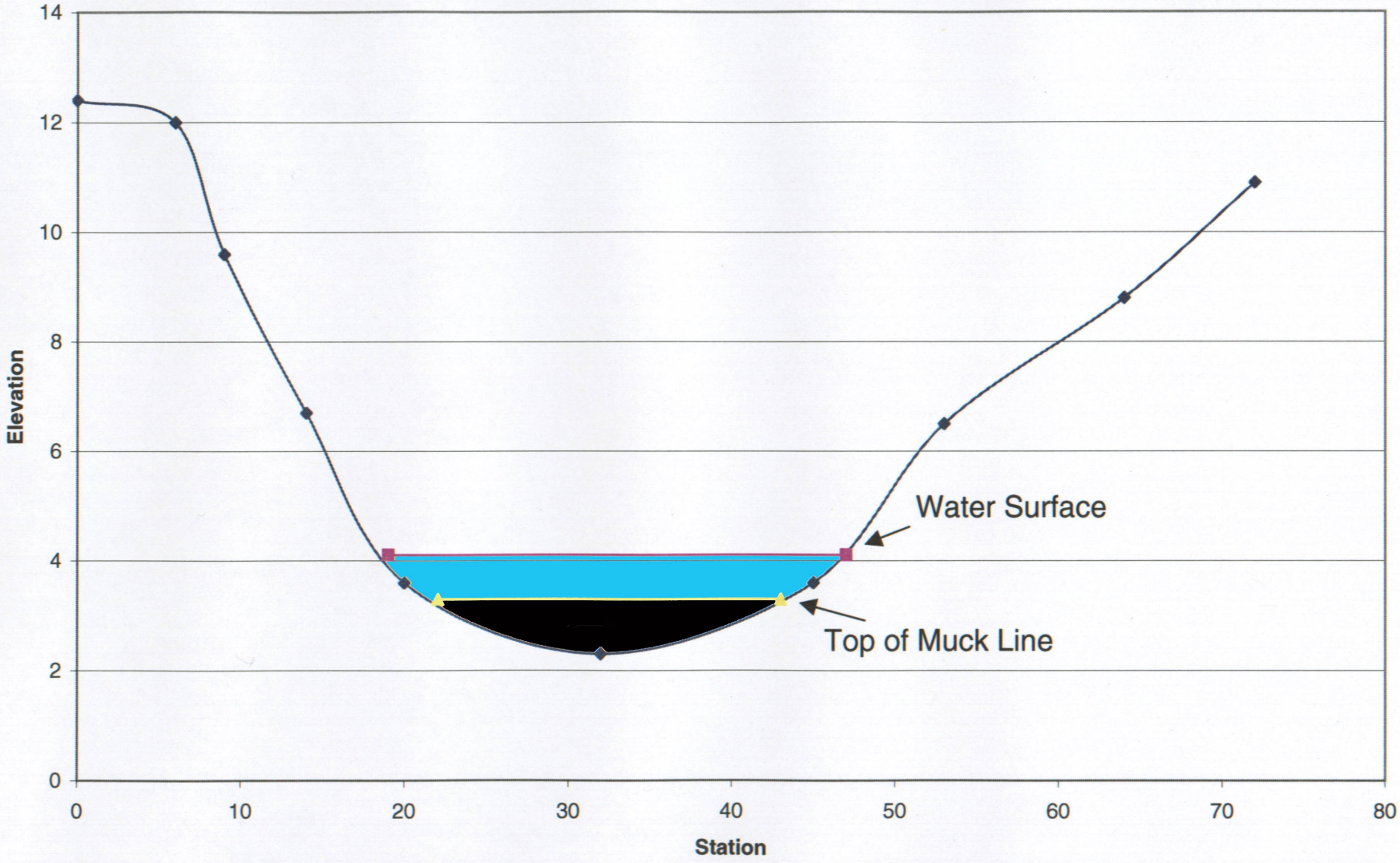
OBJECTIVE

To restore New River to a less degraded, more natural state by improving water quality, aesthetics, and recreational fishery opportunities.

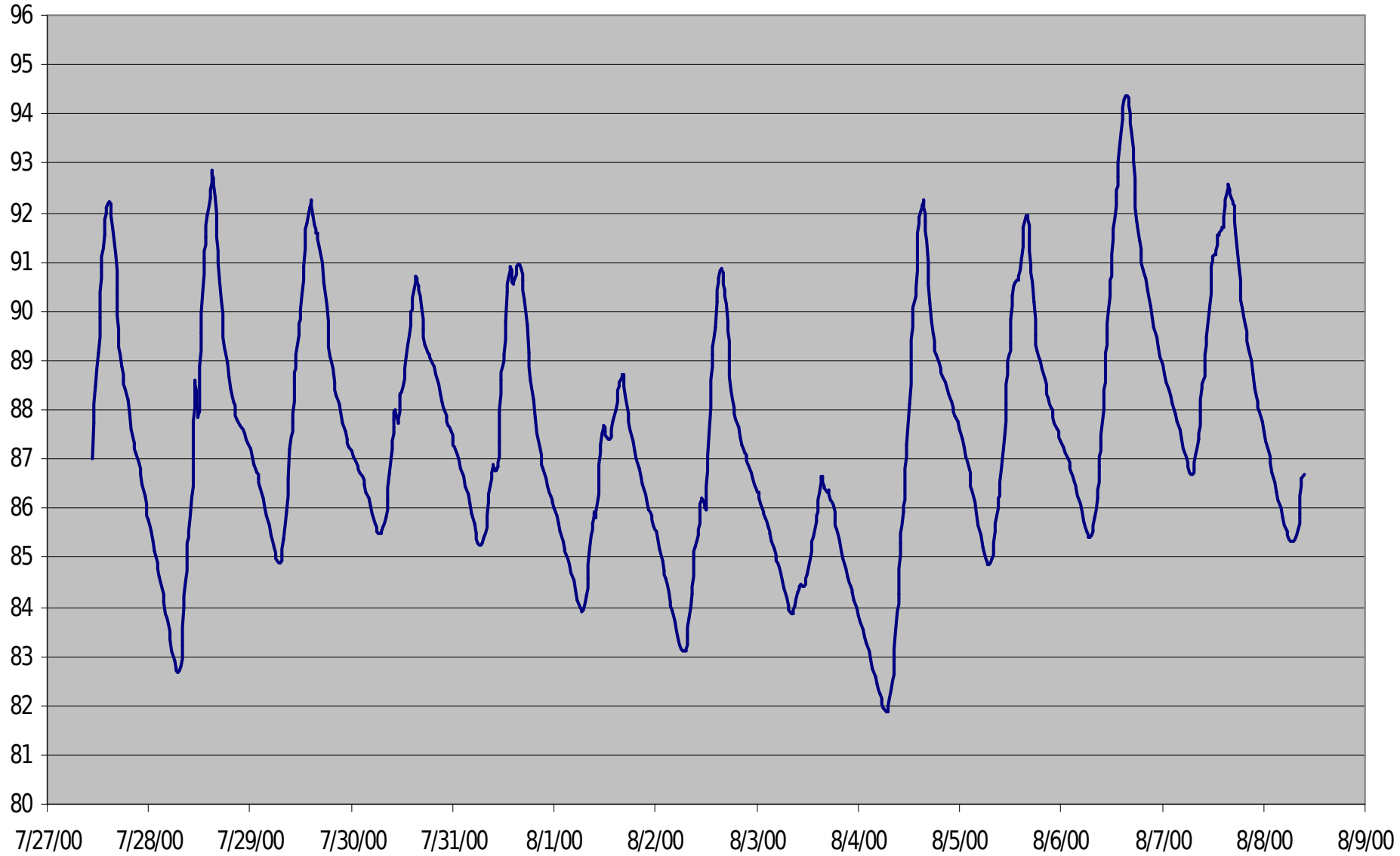
DATA COLLECTED

- Survey of New River from the Mississippi River to just below the weir in Gonzales, including cross sections, profile, and organic (muck) depth
- Water quality data (Temperature, dissolved oxygen)
- Sediment Analysis
- Fisheries data

Typical New River Cross Section

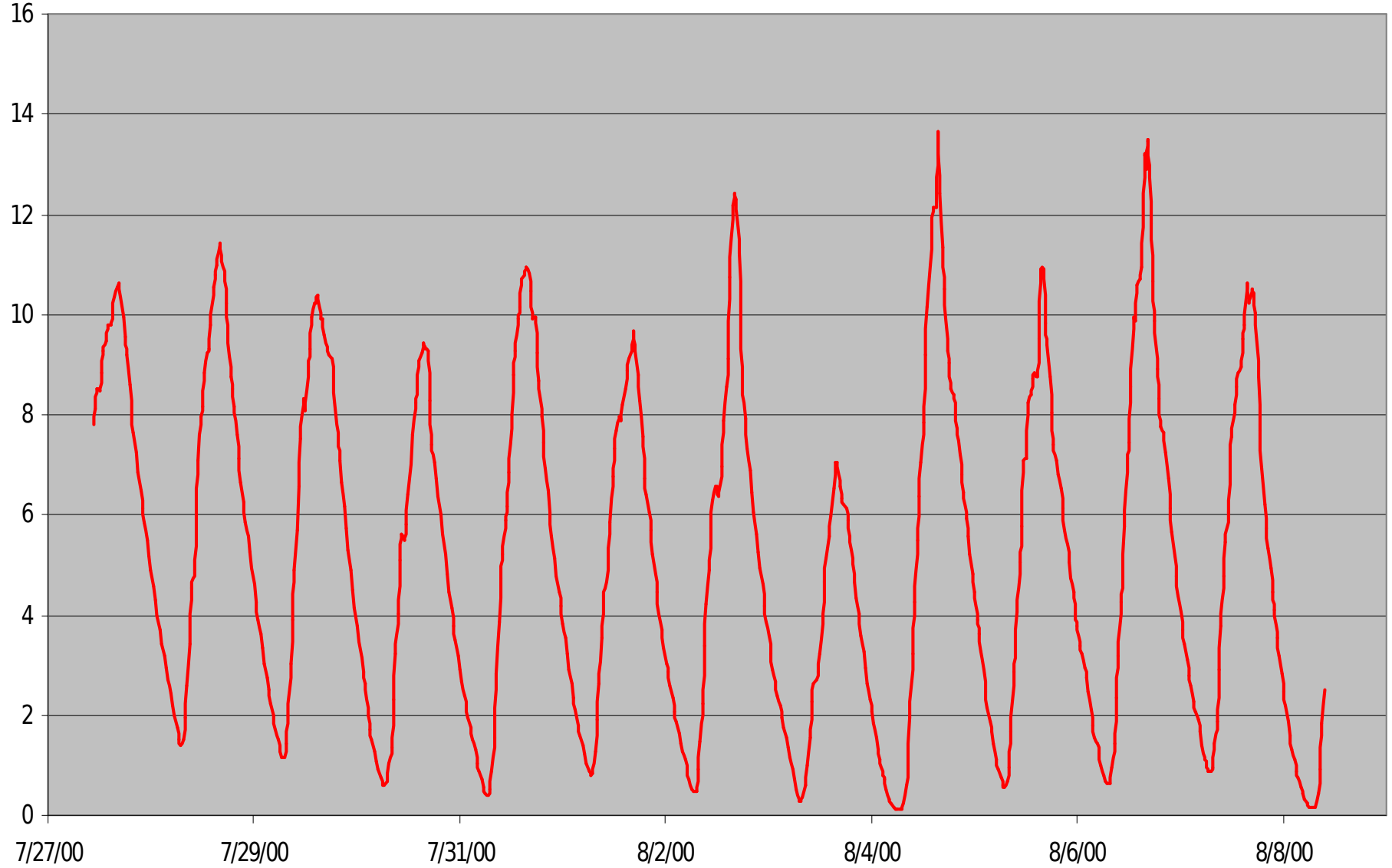


Temperature (°F)



Near Country Club

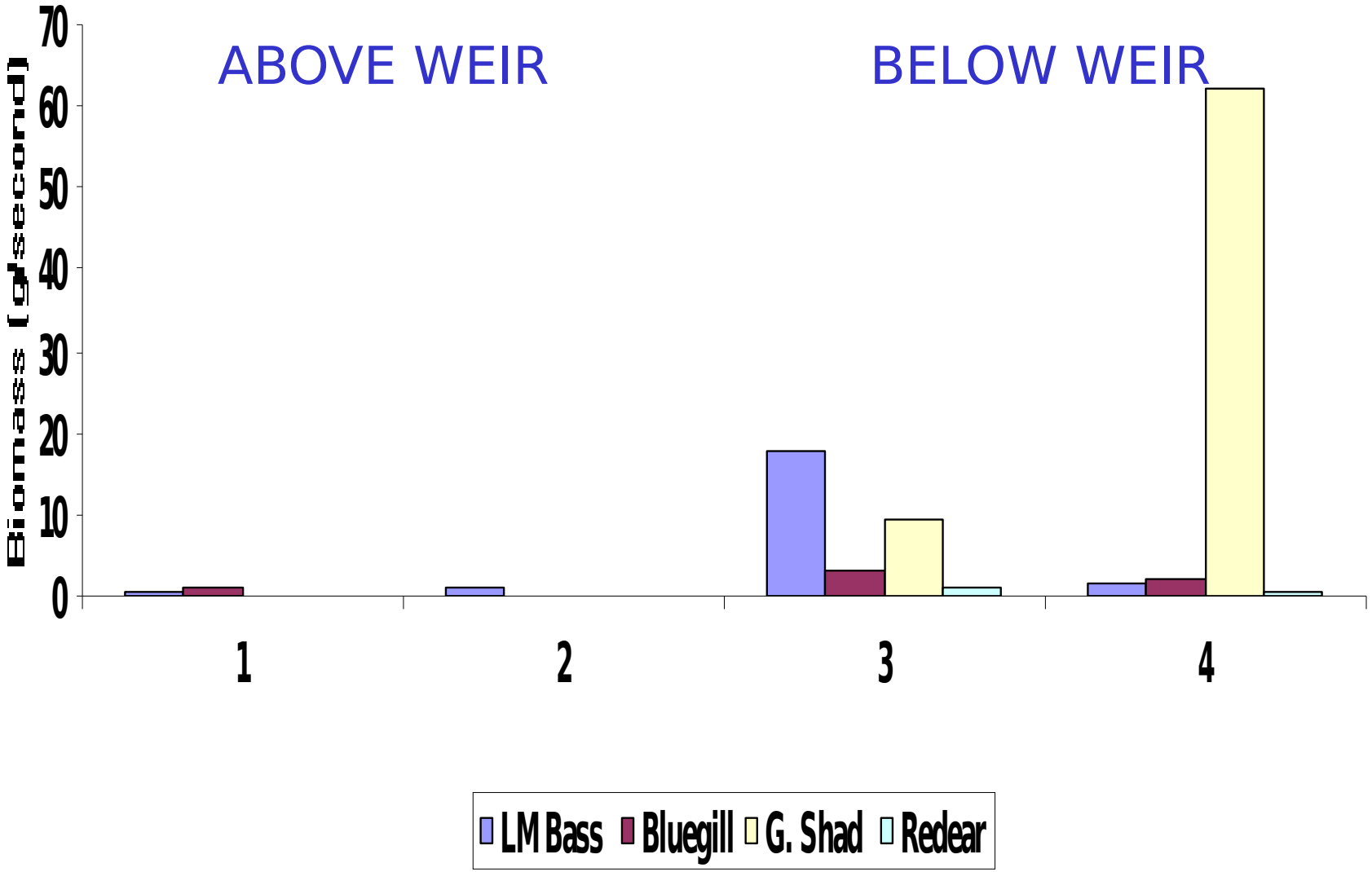
Dissolved Oxygen Concentration (mg/L)



Near Country Club

Fisheries

- Electro-shocked at two stations above the weir and two stations below the weir.
- Results – The fish below the weir were much larger and more abundant than those above the weir. Greater numbers and larger average sizes of Largemouth Bass and Gizzard Shad indicate that dissolved oxygen is not a problem downstream of the weir.


ABOVE WEIR
BELOW WEIR
Biomass (g/second)
70
60
50
40
30
20
10
0
1
2
3
4
LM Bass
Bluegill
G. Shad
Redear

PROBLEMS IDENTIFIED

- Evidence of extremely low dissolved oxygen, due to heavy loads of organic material (Muck)
- Evidence of extremely high water temperatures in the summer, due to shallow water and loss of stream bank vegetation

ORGANIC ACCUMULATION

- Weir has altered hydraulics leading to the accumulation of muck as well as prevention of the oxidation of this material.
- Loss of streamside management zone. No uptake of incoming organic material
  - Steady input of fertilizer runoff, sewerage effluent, and grass clippings.
- Application of herbicide for water hyacinth.

Initial Study Conclusion

Restoration effort should focus on the removal of existing and prevention of further accumulation of organic material and the increase of water depth to improve water quality and fisheries habitat

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ALTERNATIVE PLANS EVALUATED

- **No-action**
- **Pump from river - pump water from Mississippi river to improve water quality**
- **Dredge and Streamside Management Zone (SMZ) – dredge out the muck, plant trees in the streamside management zone.**
- **Fish holes - dredge deeper areas for temperature stability and fisheries**
- **Natural Stream Design – remove weir, dredge smaller channel to create needed water depth, plant ground cover, establish streamside management zones, plant trees**

PUMP FROM RIVER

- Cost $1.5 million to construct pump and $80,000 to $120,000 in annual operation and maintenance (100% local sponsor cost)
- It would take a particle of water approximately 20 hours to reach Gonzales (at 100 cfs)
- Average summer temperature of Mississippi river water is 84^{o}
- Little or no temperature reduction expected, continue to heat in shallow water, unlikely to move much organics out
- May create dredging concerns

DREDGE AND SMZ

- Dredge to remove muck and achieve increased water depth
- Estimated that it would have to be dredged every 10 years (100% local cost)
- Plant trees to improve fish and wildlife habitat, increase shading to reduce excessive water temperatures, and improve aesthetics
- Weir to remain in place

FISH HOLES

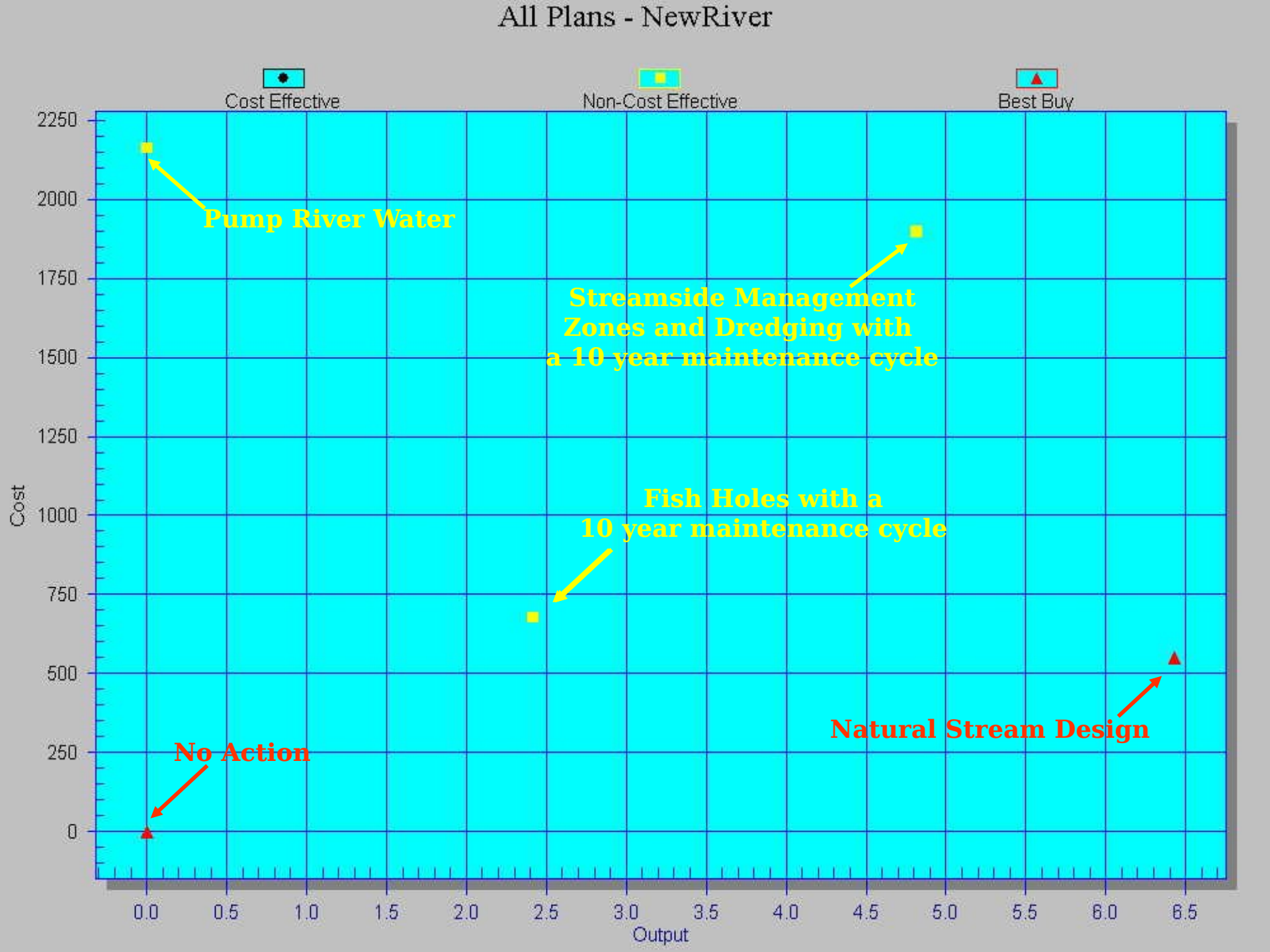
- Dredge to deepen selected segments, about 25% of the river
- Reduce temperature extremes in the “fish holes” by creating more volume
- Some improvement for fisheries
- May moderately help with dissolved oxygen
- Will likely fill back in very quickly, which will diminish benefits

Natural Stream Design

- Remove weir to allow natural hydraulics and natural oxidation of muck.
- Dredge a channel with the approximately the same width and depth as the natural channel downstream of the weir.
- Plant native trees and vegetation to improve fish and wildlife habitat, increase shading to reduce excessive water temperatures, and improve aesthetics
- This channel would be essentially self maintaining.

Costs and Benefits

- Used a combination of average annual habitat units (AAHU) for
  - Bluegill,
  - Largemouth Bass, and
- Wetland Value Assessment (WVA)
- Standard Cost Engineering


All Plans - NewRiver
Cost Effective
Non-Cost Effective
Best Buy
Pump River Water
Streamside Management
Zones and Dredging with
a 10 year maintenance cycle
Fish Holes with a
10 year maintenance cycle
Natural Stream Design
No Action
Cost
2250
2000
1750
1500
1250
1000
750
500
250
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
Output

Natural Stream Design

- Remove weir to allow natural hydraulics and natural oxidation of organic load.
- Allow about 6 months or so for the new smaller channel to find its more sinuous course. Allow growth of ground cover and native plants.
- Begin dredging the channel, using the low water surface as an indicator to how deep to dredge, up to about 4-6 feet deep.
- Depending upon how the material compacts, material would either be disposed offsite or along the new wetland area.

PLANTINGS

- FOR COST ESTIMATION, WE USED 3-GALLON AND 7-GALLON BALDCYPRESS TREES. WE CAN ALSO CONSIDER OTHER NATIVE VEGETATION, DEPENDING UPON THE HABITAT AND WATER LEVEL, WATER OAKS, COMMON PERSIMMON, WATER TUPELO, IRIS, ETC.
- PLANTING WOULD BE IN A NATURAL PATTERN, GROUPS AND VOIDS, NO TELEPHONE POLE LIKE APPEARANCE.
- EXOTICS, SUCH AS CHINESE TALLOW AND WATER HYACINTH MUST BE ELIMINATED AND CONTROLLED.

ENVIRONMENTAL BENEFITS

- Improve fish and wildlife habitat
- Improve water quality, uptake of sewerage effluent
- Create approximately 4 acres of wetlands
- Many other species would benefit, including great egret, wood duck, small mammals, amphibians, etc.

FLOOD-DAMAGE REDUCTION BENEFITS

100-year Flood event reductions:

- **Vicinity of weir: 7.79 – 7.72 = 0.07**
- **Vicinity of Hwy 61: 8.29 – 8.28 = 0.01**
- **Vicinity of Bayou Goudine: 9.25 – 9.13 = 0.12**
- **Vicinity of I-10: 12.21 – 11.49 = 0.72**

WHERE DO WE GO FROM HERE?

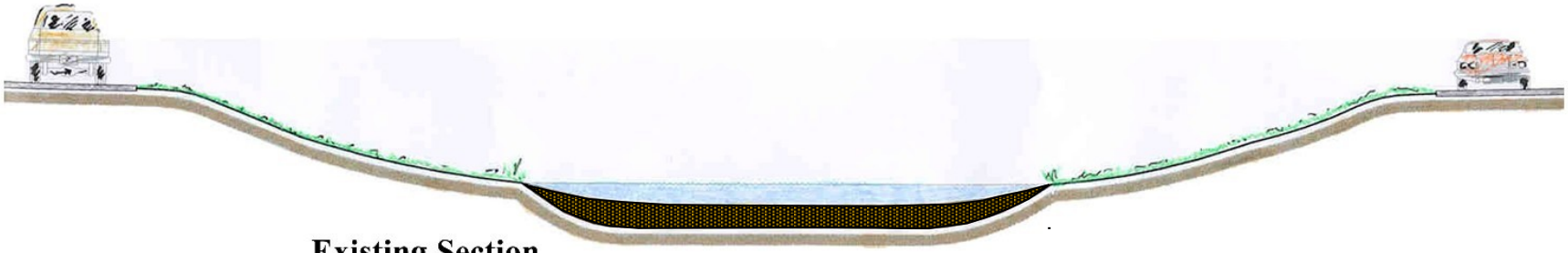
- **Need confirmation of local sponsor**
- **Complete feasibility report, technical and Public review.**
- **Review by Mississippi Valley Division (Vicksburg)**
- **Execute PCA**
- **Construction**

Project Costs

- ***Estimated Total Study Costs = $350,000***
- ***Estimated Construction Costs = $650,000***
- ***Estimated Total Project Cost = $1,000,000***

- ***Estimated Sponsor Cost = $250,000***
- ***Estimated Federal Cost = $750,000***

Conceptual Construction Scenario for New River Restoration



Existing Section

Post Restoration Section

US Army Corps of Engineers

Glenn Shaheen & Associates, Inc. GSA Consulting Engineers

New River Restoration

Typical section

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of Engineers

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GSA
Consulting Engineers

New River Restoration

Existing Site Photograph

US Army Corps
of Engineers

Glenn Shaheen & Associates, Inc.
GSA
Consulting Engineers

New River Restoration

First Week Post Weir Removal

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Consulting Engineers

New River Restoration

Rye Grass and Clover Planting

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of Engineers

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New River Restoration

1 Year Growth Projection

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of Engineers

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Consulting Engineers

New River Restoration

5 Year Growth Projection

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of Engineers

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New River Restoration

25 Year Growth Projection

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of Engineers

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New River Restoration

Overall Master Plan

Amenities Not Part of Restoration Project
(Sidewalk, Bridge, Deck, Benches, Etc..)